

Parental duties, labor market behavior, and single fatherhood in America

Aaron Albert ¹

Received: 4 August 2017 / Accepted: 28 May 2018 / Published online: 26 June 2018
© Springer Science+Business Media, LLC, part of Springer Nature 2018

Abstract Longitudinal analysis using samples from the Panel Study of Income Dynamics suggests that men’s income and wages decrease after entering into single fatherhood by marital separation. This loss exceeds what can be explained by marital separation alone. Using a difference in difference approach, I estimate that single fatherhood suppresses men’s annual income by more than \$8,000 per year, putting these men and their children at increased economic risk. Similar labor market changes are experienced by widower fathers, a subset of exogenous single fathers. The apparent effects show persistence after single fathers remarry, but mostly diminish after children mature and leave the household. These results stand at odds with previous research suggesting that fatherhood increases men’s wages and hours, and that male labor market outcomes are not significantly influenced by housework.

Keywords Single fatherhood · Single parenting · Housework · Labor supply · Separation

JEL classification numbers J12 · J13 · J22

1 Introduction

Although single fatherhood was relatively uncommon for much of the 20th century, it has become increasingly prevalent. Data from the 2010 census suggests America

The views expressed in this article are those of the author and not necessarily those of the U.S. Air Force Academy, the U.S. Air Force, the Department of Defense, or the U.S. Government.

✉ Aaron Albert
aaron.albert@usafa.edu

¹ Department of Economics and Geosciences, United States Air Force Academy, Air Force Academy, CO 80840, USA

has over 3 million single fathers.¹ Although there are about 3 times as many single mothers, very little is known about the circumstances or effects of single fatherhood.² In this paper I estimate the effect of single fatherhood on men's labor market outcomes using samples from the Panel Study of Income Dynamics (PSID). Even controlling for individual differences, single fatherhood is associated with significant changes for men entering into single fatherhood through marital separation. These "separated fathers" experience a sizable decrease in income and wages and an increase in hours of housework that exceeds what is experienced by other separated men. These changes persist after men remarry, but diminish after their children mature and leave the household. Moreover, single fathers' dramatic labor market changes are present even with widower-fathers who have not likely planned for or chosen the role of single parent. This provides the first evidence that single fatherhood is a significant obstacle to men's labor market success, raising concerns for the wellbeing of affected men and their children.

Several concurrent phenomena contribute to the rapid increase in single parent households. First, the increasing age of first marriage has led to an increase in children born to unwed parents. In addition, the increase in single parent households may be attributed to changes in state divorce laws. Gruber (2004) suggests that states' adoption of laws permitting unilateral and no-fault divorces in the 1960s and 1970s made it easier for couples to separate, with or without children. Although some (e.g. Wolfers (2006)) believe that there is insufficient empirical evidence to conclude divorce laws were to blame, national divorce rates spiked rapidly in the early 70s only recently returning to their pre-1970 level. This led to a wave of separated families in the mid to late 1970s, with mostly mothers being awarded custody due to customs and precedents in individual states. In addition to an increase in single parenting in general, there has also been an increase in single fatherhood. Cancian et al. (2014) document a dramatic decrease in mother-sole custody decisions from 80% to 42% of cases between 1986 and 2008, with a corresponding increase in shared custody. This suggests that fathers are now much more likely remain involved as a parent to some extent after marital separation. In the sample below, a large number of fathers sampled by the PSID appear to retain custody of their children after marital separation.

Fully understanding the effects of single fatherhood on men's labor market outcomes is important for several reasons. First, single fatherhood is responsible for dramatic reduction in the labor hours and wages of a group of men already typified by below average income and education. The decrease in these men's earning potential, therefore, puts them at significant economic risk. Moreover, a large body of research has established the importance of family income on child outcomes (e.g. Heckman and Carneiro 2003); if sole parenting puts a considerable strain on men's earnings, this could imply decreased educational and career opportunities for their children. For this reason, understanding the outcomes of single fathers is important to inform policy which supports these men and their children.

¹ With "single father" defined as unmarried men reporting own children in the household.

² Populations of single mothers and fathers estimated using 2010 census data accessed via IPUMS-USA Ruggles et al. 2010

Second, the circumstances of single fathers provide unique insight into the economic consequences of fatherhood in general. Many papers detail the effect of parenting on labor outcomes for men and women, but few natural experiments provide a truly unanticipated shock to parent status. A man informed that he will be father to natural twins,³ for instance, may have to plan to act as a father for two children instead of one. Although timing and number may be a surprise, he has likely planned to be a father for many years. Widower fathers are unlikely to have chosen or planned for their role as single fathers enough years in advance to influence their educational attainment, industry, occupation, etc.

Although it may be unsurprising that single fatherhood significantly disadvantages men on the labor market, this stands in stark contrast to existing results regarding the effects of parenting on men's labor outcomes. First, previous work suggest that men earn more and work more as fathers,⁴ presumably because men specialize in market work to support their children and partner, who assumes the majority of household duties. This pattern of household specialization may be true in many cases, but this paper provides evidence that the effect of children on men's labor outcomes depends on who is doing the housework. Second, previous studies suggest that housework has a negative effect on female hours and wages but does not significantly influence the labor outcomes of men.⁵ Single fatherhood causes a sudden and sizable increase in men's housework hours which is concurrent with dramatic declines in wages and work hours. Widower fathers, therefore, provide evidence that sufficiently large unexpected increases in housework hours indeed negatively influence the labor outcomes of men.

2 Related literature

Household division of labor and its implications for labor market outcomes was first analyzed theoretically in Becker (1973). Becker showed that, due to gains from specialization, small differences in comparative advantage between market and home productivity can lead to large differences in the behavior of married men and women. This model suggests that marriage (and children) should increase specialization causing men's labor hours to increase while women's fall (with the opposite effect on home production). If human capital accumulates on the job, this could lead to increased market productivity and thus increased wage rates for men. Empirical studies support this specialization story: marriage has zero or negative effect on female wages (Korenman and Neumark 1992) and a positive effect on male wages (Korenman and Neumark 1991). Conversely, Jakobsson and Kotsadam (2016) suggests that men's labor market advantages after marriage appear to be both shrinking and likely explained by selection. Children seem to increase this specialization: the advent of children is associated with decreases in female wages (Korenman and Neumark 1992) and hours (Bianchi 2000, Angrist and Evans 1998), and

³ As in Angrist and Evans 1998

⁴ e.g. Lundberg and Rose 2002

⁵ e.g. Hersch and Stratton (1997)

increases in male wages and hours (Lundberg and Rose 2002). Interestingly, Hersch (2013) finds that women graduating from more selective institutions show even greater decreases in wages and hours associated with marriage and children. This suggests that specialization in household production is not unique to females with poor labor market preparation. As one would expect, marital separation has the opposite effect of marriage on specialization. Empirical work confirms that females work more after divorce while males work less (Mueller 2005).

Becker (1985) offers an alternate explanation for the changes in hours and wages of married men and women. Becker suggests that productivity (and thus wages) may be hurt by housework due to its exhausting nature. If married women perform more housework due to comparative advantage, the fatiguing nature of housework may suppress their market wage (and thus hours). Although most empirical work on housework suggests no effect on male wages, Bryan and Sevilla-Sanz (2011) shows that male wages are negatively affected by housework in the UK (see Maani and Cruickshank (2010) for a survey of the housework literature). Other research has suggested that flexible hours, which may be necessary for primary caretakers, may also have a negative effect on earnings (Flabbi and Moro 2012).

The effects of single parenting have been well-detailed from the perspective of single mothers. Because single-motherhood is common among the poor, much of the work on single mothers focuses on topics such as incidence of poverty, welfare burden, and response to relevant policy reforms (for instance see Meyer and Sullivan 2008, Card and Blank 2008, Mammen 2008, and many others).

Although the labor market effects of children have been well studied for other groups, single fathers provide unique evidence on the effects of unanticipated changes to parenting status. Although natural experiments (such as Angrist and Evans 1998) may provide evidence of the effect of changes in number of children, the parenting of children by married couples is not an unanticipated shock. Men and women choose education and careers with expectations regarding their future roles as both parent and provider. Similarly, many children are born out of wedlock and mothers most often assume custody after marital separation so single motherhood may be anticipated as a possible outcome for many mothers. Because single fatherhood is comparatively less common, men may not anticipate their future role as single father. For this reason, the changes experienced by single fathers may be more likely due to changes in parenting status rather than the result of years of decisions leading to an anticipated parenting status.

The closest work to what follows is Brown (2000) which profiles the American single father population using CPS data from the 1980s and 1990s. This study, however, shows only general patterns without pursuing any causal link between single fatherhood and outcomes. Another similar work is Lin and Chen (2006). This paper shows that a group they define as “custodial fathers” work more hours than married fathers; however, this paper does not explicitly estimate causal effects and focuses on “custodial fathers” which are not exactly the same population as “single fathers”.⁶ Lerman and Sorensen (2000) shows that the earnings of non-custodial

⁶ “Custodial father” is a term specific to their paper, meaning that a child lives in the home but at least one of the child’s parents lives elsewhere.

fathers increase with contact and participation in the lives of their children.⁷ Unlike these papers, I will explicitly seek causal effects using recent longitudinal data and will make use of plausibly exogenous single fatherhood due to spousal death.

3 Panel data description

To measure the labor market changes associated with single fatherhood I create a sample of the male heads-of-household in the Panel Study of Income Dynamics (PSID), including all subsamples to maximize sample size. The PSID is a natural choice due to its size and demographic diversity of sampled individuals. I retain male heads of households aged 18–65. Household heads are selected because these individuals have the most consistently available labor market and housework information and because these individuals include almost all of the fathers sampled.⁸ I will also focus analysis on years 1976–2013. Questions related to the household head's weekly housework hours are most consistent beginning in 1976⁹. It is important to note that the PSID sampled households only biannually starting in 1999. Using the later biannual samples could be problematic because some fathers may separate and remarry between samples. Moreover, men in their first and second year of separation cannot be differentiated despite possible differences in labor outcomes. In order to maximize sample size I will retain all relevant individuals sampled since 1976, but note that similar results hold using only the annual surveys (i.e. 1976–1997). Lastly, so that each individual has sufficient observed years for comparison, I include only men with surveys complete in labor and marital status information for at least 5 of the years sampled.¹⁰ This results in a total of 124,893 observations over 8,399 individuals. Table (1) summarizes demographic features of these men in their first year observed in our sample. These men were 30.8 years old on average and held average years of schooling equal to a high school diploma. Of these men, 46% had children and 74.4% were married.

Although my sample includes all male heads-of-household, “fathers” are of particular interest. In what follows below, I will define “father” as a man with one or more children aged 17 or younger living in his family unit. This includes any child designated as part of the man's family including own children, step-children, and adopted children. It is important to note that some men are designated as a “father” without having any own children in their household due to blended families and other unusual living situations. In addition, men with children outside their family unit (i.e. living separately) are not considered to be a father. This definition of fatherhood is appropriate because the paper intends to measure the effect of serving in the parent role regardless of child origin or

⁷ The focal group of this paper is men with children living outside their household.

⁸ This sample excludes only fathers living in blended or multi-generational families which they do not head e.g. fathers living in households headed by their own father.

⁹ Questions on housework in previous years use either different wording, ask annual not weekly hours, or are available only in intervals (as opposed to continuous hours) making them less comparable to data beginning in 1976.

¹⁰ Information on housework hours is not available for 1982, so all observations from this year will be excluded from specifications including housework.

Table 1 PSID Male Heads of Household, First Year Observed

Variable Name	Mean	Standard Deviation
Age	30.8	(10.5)
Years Edu	12.5	(2.6)
# Children	0.9	(1.3)
Has children	46.1	(49.9)
Age youngest	2.5	(4.2)
Married	74.4	(43.7)
White	62.2	(48.5)
Black	30.1	(45.9)
Other	7.7	(26.7)
Year	1984.5	(9.1)
N	8399	

Values shown are average values in first year observed for all male heads of household sampled. Standard deviations are in parenthesis.

custody. In total there are 68,048 observations over 6,896 men who are fathers as defined. This includes 64,456 observations of 6,759 individuals considered to be “married fathers”, 378 observations over 195 individuals observed as “widowed fathers”, and 2,452 observations over 1,374 of fathers who are separated or divorced.¹¹ Fatherhood before first marriage is an interesting and increasingly common phenomenon. Although these “Never Married Fathers” could be grouped with other single father the transition from unmarried non-father to single father is necessarily different from the transition of married father to unmarried father. Moreover, these “Never Married Fathers” are demographically very different from other men; men fathering children before their first marriage are overall much younger, have lower educational attainment, have lower income, and work fewer hours before their first year of single fatherhood even when adjusted for age, education, race, etc. For this reason they may not be comparable to either married or separated fathers and will not be included in later analysis.

This paper will focus on the transition from married father to separated father and its labor market implications. To facilitate simple comparisons between the different men sampled, Table (2) provides average demographic features for fathers (and separated non-fathers) sampled by group. First, single fathers average about two years older than other separated men, have one half of a year less education, and differ in racial composition with more black (and fewer white) separated non-fathers. Compared to married fathers, separated fathers are one year older, have older children, and have one half of a year less formal education. Since separated fatherhood necessarily follows married fatherhood some difference in average age is unsurprising. I also find that separated fathers differ racially, with 10 percentage points fewer identifying as white and a similar proportion reporting race as black. Widowed

¹¹ Totals reported by father type are total men ever observed in given group. Men may appear in multiple groups across the panel e.g. a married man with children whom then becomes divorced but retains custody would be observed as both a “married father” and a “separated father” in different years.

Table 2 Demographics, all years

	Married father	Single father	Widower father	Separated, no child
Age	37.6 (8.9)	38.8 (9.7)	47.7 (11.0)	36.5 (12.0)
Years edu	12.8 (2.6)	12.2 (2.6)	10.5 (3.6)	12.7 (2.6)
# Children	2.0 (1.0)	1.8 (1.0)	1.8 (1.1)	0.0 (0.0)
Age youngest	6.5 (5.0)	8.4 (5.1)	9.4 (5.4)	0.0 (0.0)
White	66.8 (47.1)	56.2 (49.6)	42.6 (49.5)	54.8 (49.8)
Black	28.3 (45.1)	38.7 (48.7)	52.9 (50.0)	42.0 (49.4)
Other	4.8 (21.4)	5.1 (22.1)	4.5 (20.8)	3.2 (17.7)
First observed	1981.9 (7.8)	1982.6 (7.9)	1979.3 (6.2)	1982.6 (7.7)
N	64,456	2,830	378	21,467
Individuals	6759	1541	195	3833

Values shown are average values for all years for all male heads of household sampled. Standard deviations are in parenthesis.

fathers are particularly interesting because their transition from married to unmarried status is likely not a choice. Similarly, almost all widowed fathers sampled retain child custody allowing abstraction from the selection into separated fatherhood among separated men. The widowed father population sampled appears very different from other groups. Widowed fathers are 48 years old on average; this is much older than either married or separated fathers. These men, however, have children only a year older than separated fathers. Widowed fathers average around 10 years of schooling, almost two years less than other separated fathers. About 50% of the widowed fathers report race as black, a proportion twice that which was found with married fathers. Figure (1) shows trends across time in demographic variables for married vs. single fathers. The averages for single fathers observed are more volatile due to smaller sample size. Throughout, the pattern seems consistent with the static trends described above; single fathers are older, less educated, have fewer children, and are less likely to identify as white than married fathers. Trends in these four variables appear mostly similar for married and separated fathers during the years sampled, although white single fathers appear to be on the rise comparatively.

More striking are differences in labor force outcomes for the different men sampled. Table (3) provides a summary of labor market outcomes for married fathers, separated fathers (including widowers), widowed fathers, and separated non-fathers. Single fathers have similar labor hours as separated non-fathers. Married fathers work 500 hours more per year than separated fathers and 700 more than widowed fathers. For income and wage rate here I will examine data as percentiles to abstract from annual differences over the sample period. Married fathers earn much more per year than other men sampled with annual labor income 14 percentiles higher than separated fathers, 16 percentiles higher than separated non-fathers, and 20 percentiles higher than widowed fathers.¹² The differences in income are not entirely due to differences in hours worked; married fathers also have higher wage rates than other men. Much of the discussion below will focus on changes in housework. With this in mind, it is important to note that housework in the PSID is defined fairly similarly each year with question text such as “About

¹² All Labor and Personal Income data used throughout the paper are inflation adjusted to base year 2010.

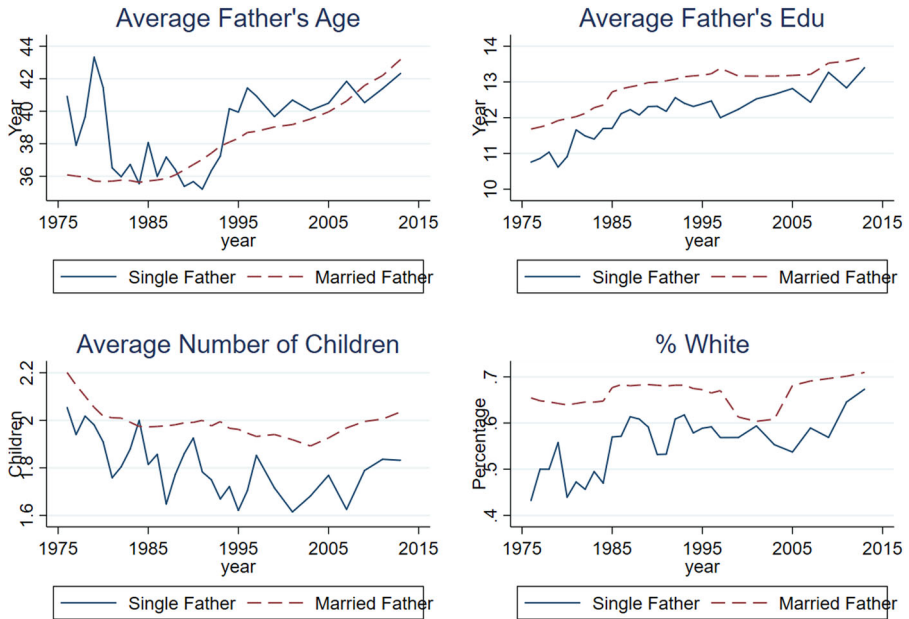


Fig. 1 Demographic trends, married vs. single fathers. y-axis shows unconditional average of outcomes for married father (or single father) in each year using all relevant observations

Table 3 Labor outcomes, all years

	Married father	Single father	Widower father	Separated, no child
Labor hours	2118.8 (795.8)	1652.3 (946.2)	1389.0 (1019.2)	1699.4 (972.8)
Housework hours	399.1 (487.3)	759.6 (636.2)	844.7 (755.5)	437.0 (494.8)
Income (Percentile)	53.7 (29.1)	39.6 (28.3)	34.0 (30.8)	37.9 (27.3)
Wage rate (Percentile)	52.4 (28.8)	43.6 (27.8)	42.2 (31.4)	40.7 (27.2)
Personal income (Percentile)	54.0 (27.7)	38.8 (28.1)	50.8 (30.7)	35.5 (27.6)
Moved?	20.1 (40.0)	41.6 (49.3)	16.7 (37.3)	44.2 (49.7)
Changed Jobs?	34.0 (47.4)	45.4 (49.8)	54.8 (49.8)	49.2 (50.0)
N	64,456	2,830	378	21,467
Individuals	6759	1541	195	3833

Values shown are average values for all years for all male heads of household sampled. Standard deviations are in parenthesis.

how much time (does he/she) (do you) spend on this housework in an average week—I mean time spent cooking, cleaning, and other work around the house?” Importantly, this neither explicitly includes nor excludes childcare time, and the PSID asked specifically for childcare hours in only a few years. For this reason, housework hours will be viewed as an imperfect measure of combined housework and childcare time. Separated and widowed fathers perform 450–550 additional hours of housework per year, which is

nearly twice as much as performed by married fathers and separated non-fathers. This likely reduces the time and energy they have left to succeed in the labor market.¹³ Some of the disparity in labor outcomes, however, is likely due to factors other than the burden of sole parenting. First, single fathers are different from other men in many ways including age and socio-economic status. These factors are correlated with labor outcomes. Moreover, marital separation itself is known to be associated with labor market changes (Mueller 2005). For this reason, the sections below will use observations on men transitioning from married to single father and identify the effects of single fatherhood specifically as the additional differences in labor market outcomes associated with marital separation for men continuing to care for their children.

Additional results will show changes in other outcomes. Single fathers moving or changing jobs would provide evidence of men changing consumption patterns or seeking more flexible employment. It appears that single fathers are significantly more likely to report having moved (41.6% vs. 20.1%) and widowers appear to move very infrequently (16.7%). Separated non-fathers move even more frequently (44.2%). Widowers are most likely to report changes in place of employment (54.8%) with married fathers changing jobs less frequently (34%), and separated fathers and separated non-fathers falling somewhere in between (45.4 and 49.2%). We also might wonder how men's personal income changes because single fathers may choose to work less due to an increase in non-labor income such as assistance from friends and family and/or life insurance. As seen when comparing labor incomes, married fathers appear the most wealthy as measured by personal income with income (54th percentile) much higher than separated fathers (38.8th percentile) but only slightly higher than widower fathers (50.8th percentile). Separated non-fathers have personal income around the 35th percentile.¹⁴

The panel nature of the data used allows us to compare the fathers sampled through time. First, looking at unconditional averages (Fig. (2)) suggests dramatic labor market changes as men transition into single fatherhood. This figure shows unweighted averages of the focal labor market outcomes for all men observed that experience single fatherhood. Although labor hours show a general downward trend during the years around marital separation, hours appear to drop from an average of around 2,000 to 1,600 hours annually quite suddenly in the year of marital separation. The following year shows recovery, returning approximately to the pre-separation trend for years 1–3. Housework increases from around 400 hours per year to around 800 in the first year of single fatherhood, lowering to a still elevated 600 hours in future years. Again, there appears to be little anticipatory effect. Wage rate appears to fall steadily leading up to single fatherhood, and trends upwards after. Labor income follows a similar pattern. Although no causal relationship can be inferred from these unconditional averages, they do show dramatic changes concurrent with the transition to single fatherhood.

We might be concerned that men losing custody differ significantly from single fathers in their pre-separation labor market outcomes. Table (4) compares the labor

¹³ Annual housework hours are calculated as 52x weekly housework hours reported. This is done to facilitate comparison with labor hours which are reported as annual.

¹⁴ Personal Income is estimated as family income minus the sum of wife's wages, wife's business income, as well as the taxable income and transfers received by other family members.

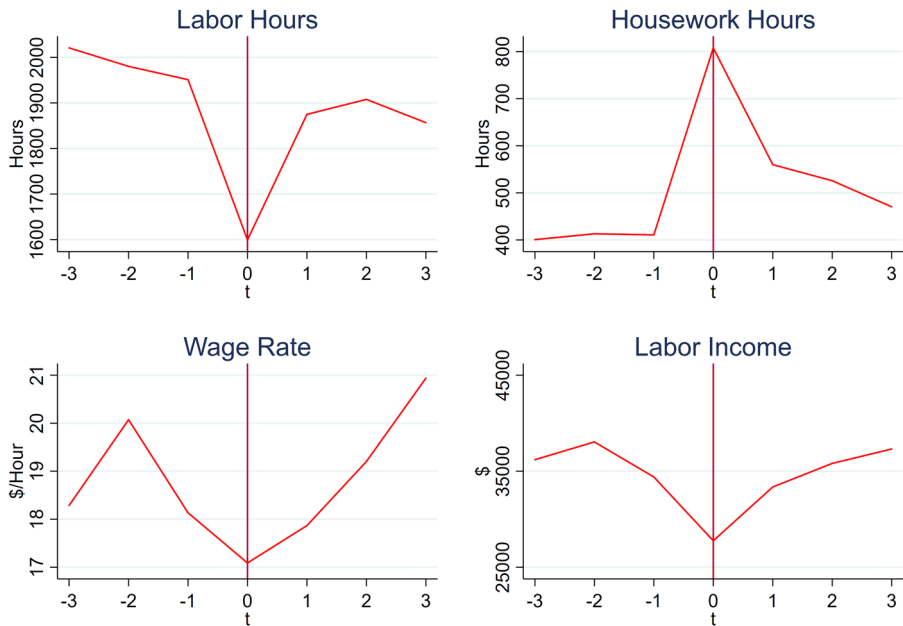


Fig. 2 Trend in average labor market outcomes, single fathers. y-axis shows unconditional average of outcomes for all single fathers observed. x-axis is years before (or after) single fatherhood begins, with “0” being the first year of observed single fatherhood

Table 4 Labor and housework, just separated, single father vs. separated-was father

	Was Father		Single Father		Difference	
Income	38483.8	(32227.8)	38789.2	(34671.7)	-305.5	(1612.5)
Wage rate	19.9	(19.7)	20.2	(17.9)	-0.4	(0.9)
Housework—self	395.2	(464.7)	405.5	(534.5)	-10.3	(24.8)
Housework—wife	1154.2	(804.4)	1173.4	(870.1)	-19.2	(41.4)
Labor Hours—self	2048.1	(858.1)	1962.9	(911.1)	85.2**	(42.6)
Labor Hours—wife	1151.8	(919.4)	1098.7	(910.2)	53.1	(43.9)
N	786		970			

Columns 1 and 2 show average values for men that have separated, two years before marital separation. Standard deviations are in parenthesis. Column 3 shows difference in averages with standard error in parenthesis.

market outcomes in the households of men who end up as single fathers to those of men appearing without children after marital separation, and suggests that these two groups of men have more in common than we might otherwise expect.¹⁵ This table identifies two sets of men in similar circumstances: men with and without children in their first year of separation (divorced, separated, or widowed), who had children aged 16 or younger in the household 2 years previously. This allows us to compare

¹⁵ There are fewer individuals in this table than in those above due to the additional restriction that men must have a valid survey exactly two years before first observed with marital separation.

the pre-separation outcomes of fathers who end up as single fathers to those that end up without children in their household (i.e. non-fathers). First, surprisingly the two groups are of such similar size, with 970 single fathers compared to only 786 men losing custody after separation. Previous literature suggests that sole custody by the mother is extremely common, e.g. totaling around 80% of separated families in Wisconsin observed from 1986 to 1994 (Cancian and Meyer 1998). The large share of men appearing to retain custody may be due to differences in sample, inclusion of widowers (who almost always retain custody), as well as use of a much broader time period. Labor income is very similar for the two groups, with both making around \$38,500 per year. The wage rate of non-fathers appears about \$0.40 per hour lower before separation. Single fathers show some evidence of prior specialization, working about 85 fewer hours per year before separation while performing about 10 hours per year more housework. The observed behavior of their spouses before separation are quite similar. Both groups have wives working on average about 1,100 hours per year and performing around 1,150 hours per year of housework. The general similarity of outcomes before separation for single fathers and other separated men suggests that men retaining custody are not a particularly unique subset in the PSID which adds credibility of estimates below comparing these single fathers to other separated men.

4 The effects of single fatherhood

Now I will explicitly seek to identify the effects of single fatherhood on annual labor hours, labor income, wage rate, and annual housework hours. My approach is to estimate a series of equations where I capture single fatherhood as the effect of having children in the household after marital separation.

Even conditioning on age, education, etc. an ordinary least squares estimate is likely to overstate the effect of single fatherhood due to correlation between single fatherhood and the unobservable individual differences between single fathers and other men. This can be addressed by adding individual fixed effects. First assume that outcomes are determined by the reduced form equations:

$$Y_{it} = \alpha_0 + \beta_0 X_{it} + \beta_1 D_{it}^{\text{SingleFather}} + u_{it} \quad (1)$$

$$u_{it} = \gamma_i + \tau_t + \varepsilon_{it} \quad (2)$$

Here Y_{it} is the dependent variable for individual “i” in year “t”, $D_{it}^{\text{SingleFather}}$ indicates separated father status and X_{it} is a matrix of relevant covariates. Relevant covariates include a “Father” indicator for one or more children in the household, and indicators for each year of age. I assume that the error term is composed of γ_i which reflects unobserved individual characteristics, τ_t the time varying component common to all individuals, and random error ε_{it} . Unobserved individual characteristics include such things as ambition, skill, and affinity for market work and housework which might influence the dependent variables; these are assumed to be time-invariant. There may be annual effects as well due to data differences, business cycles, or technological changes influencing work or housework; these are assumed to be the same for all individuals.

In Equation (1) the effect of single fatherhood is credible if one assumes that married fathers are the relevant comparison group for separated fathers. One limitation to this estimate is that previous research has shown that men's labor hours and wage rates fall after marital separation (regardless of single father status). Also, men no longer appearing as single fathers due to remarriage may differ from those with children maturing and leaving the household. For this reason, I will instead estimate the effect of single fatherhood as the additional effect of marital separation for separated fathers. Adding indicator variables for separated marital status as well as post-single father status, the effect of single fatherhood is determined by estimation of the form:

$$Y_{it} = \alpha_0 + \beta_0 X_{it} + \beta_1 D_{it}^{\text{SingleFather}} + \beta_2 D_{it}^{\text{Separated}} + \beta_4 D_{it}^{\text{Post-SF-R}} + \beta_5 D_{it}^{\text{Post-SF-M}} + u_{it} \quad (3)$$

Here $D_{it}^{\text{SingleFather}}$ reflects separated fatherhood, $D_{it}^{\text{Post-SF-R}}$ and $D_{it}^{\text{Post-SF-M}}$ indicate years after single father status has ended (either due to remarriage or children no longer in household, respectively), $D_{it}^{\text{Separated}}$ indicates divorced, separated, and widowed marital status, and X_{it} is a matrix of relevant covariates. Marital separation may be associated with changes in the dependent variables regardless of single parent status, but this should be captured by the "Separated" indicator. And, although men experiencing single fatherhood may be characterized by lower economic status, this is captured by the individual fixed effects.

Estimation of Equation (3) yields the effect of separated fatherhood conditioned on observable differences such as age and marital status as well as unobservable time invariant individual differences and therefore can be thought of as difference-in-difference. One identifying assumption, therefore, is common trend. Although this cannot be explicitly tested, I will show estimates of coefficients for the years before and after separation to show the assumption seems plausible—the estimated "effects" of single fatherhood appear to happen concurrently with the start of single fatherhood, and do not show clear anticipatory trend. In addition, we must assume that single fatherhood does not occur concurrently with important unobserved changes at the individual level. It would be problematic if, for instance, men are more likely to become single fathers during periods of low individual wages (perhaps due to lower opportunity costs of child care during these years). To address this possibility I will also show results for the effect of separated fatherhood on widower-fathers alone. Widowers are an interesting subpopulation for many reasons. First, death is used in many studies as an exogenous shock because it is less likely to be correlated with omitted characteristics than divorce (e.g. Corak 2001). Although spousal death may be related to socio-economic status, the longitudinal structure of the PSID allows me to limit this bias through use of individual fixed effects (as in Fronstin et al 2001 and many others). Using widowers also allows me to abstract from custody decisions because widowers almost always retain custody after spousal death.

The claim that widowers have little choice in their status as single fathers is justified by the fact that these men appear to retain child custody in the vast majority of cases. Around 92.5% of widowed men living with children before spousal death

report still having children in the household in their first year as a widower.¹⁶ Although significantly higher than the average year-to-year transition of married men at the 1% confidence level, this is because less than 1.5% of married men become non-fathers in a given year for reasons other than child maturation. For comparison, 55.8% of divorced men previously living with children appear as non-fathers after marital separation. Therefore, although it may be reasonable to object that divorced fathers are a select group, almost all fathers sampled become single parents after spousal death.

Although spousal death is less likely to be correlated with unobserved characteristics conditional on covariates, this approach has some disadvantages. First, spousal death may still be correlated with unobservable individual income variation (although this is less likely to be the case than with divorce). As before, this will be limited by conditioning all estimates on widower status. Moreover, since widowers tend to be older and economically disadvantaged, the effect on widowers may be different from other men. Widowers are also different from other men in many ways, so their experience may not be comparable to that of other men. The similarity of labor market outcomes for widowers and other separated fathers provides some evidence of external validity. One might also suspect widowers to remarry non-randomly; if more resilient widowers have better labor market outcomes post-separation and remarry more quickly this would bias estimates. For this reason, I will show estimates for the widowers in their first year of single fatherhood. I will also estimate the effects of single fatherhood on non-labor outcomes such as personal income, job changes, and changes in place of residence. These estimates are intended to provide evidence of whether or not single fathers make additional adjustments e.g. decreasing consumption, finding more flexible employment, etc.

5 Results

First, to support the common trends assumption, “Single Fathers” in Fig. (3) shows the results of regressing similar to Equation (1), but finding the coefficients associated with years before and after single fatherhood begins conditional on individual fixed effects, as well as age, year, fatherhood and marital status. “Single Fathers*” is similar but adds marital status indicators as in Equation (3). Each of the four graphs, therefore, show the results of one regression with the outcome of interest as the dependent variable and the years shown as estimated coefficients. In all four Equations, three or more years before marital separation is the excluded group. Estimates shown are for coefficients two years before single fatherhood (−2), one year before (−1), first year observed as a single father (i.e. year “0”), one year after (+1), two years after (+2), and more than two years after (+3+). The vertical bars show 95% confidence intervals. Estimating over all 7,997 individuals with separated or married marital status the coefficients for each year before single fatherhood are either small in magnitude or statistically insignificant in all regressions, including

¹⁶ i.e. 92.5% of men observed with children under 15 before spousal death have children under 17 in the household in the first year observed as a widower. Looking only at the annual samples and using one-year transitions this number rises to 96.5%

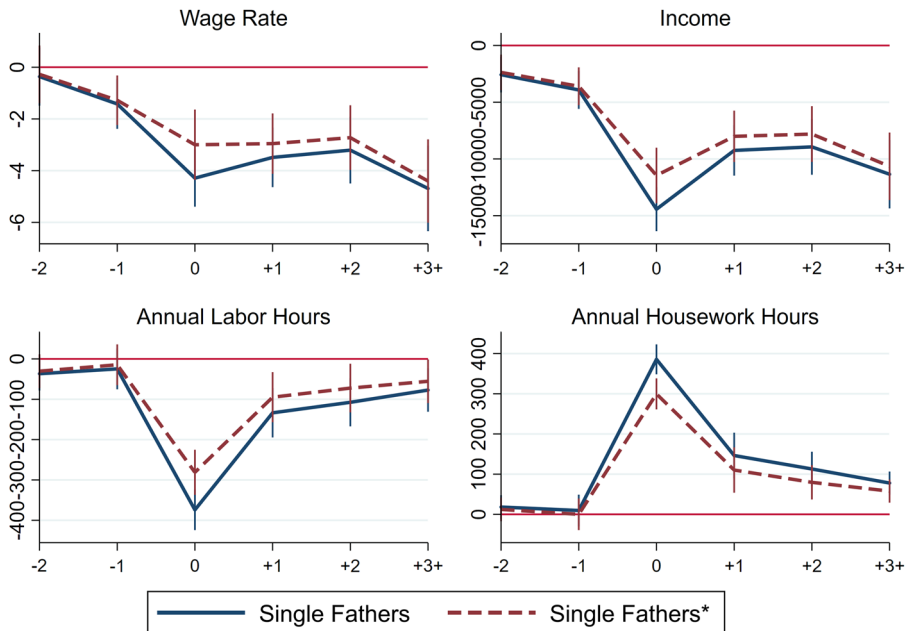


Fig. 3 Labor market changes during single fatherhood. y-axis shows regression coefficients of year vs. outcome conditioned on individual fixed effects, age, year, and fatherhood. Results for “Single Fathers*” are additionally conditioned on marital status. x-axis is years before (or after) single fatherhood begins, with “0” being the first year of observed single fatherhood

outcomes wage rate, income, labor hours, and housework hours. Annual labor income drops sharply as single fatherhood begins, with an average difference of –\$10,000. Labor hours decrease by almost 300 hours per year. This 300 hours per year is almost exactly offset by the 300 hours per year increase in housework. Although this suggests single fatherhood presents significant labor market difficulty, these differences could be attributed to the unique circumstances of divorced men selected for child custody after marital separation. Figure (4) shows the changes in income for widowed men who likely did not select into single fatherhood, as estimated using the 7,865 men observed with married or widowed status. As before, results are shown both with and without marital status indicators. Although widowed men earn \$10,000 less per year after becoming single fathers, they do not exhibit a sharp decrease in labor hours as with other separated fathers or a significant decrease in wage rate. They also experience an even larger increase in housework hours, performing an additional 400 hours of chores per year than they did before single fatherhood. Because changes in outcome appear concurrent with marital separation itself (and not part of a previous trend), patterns in single fathers’ outcomes before and after marital separation support a causal interpretation of the estimates below. Interestingly, the income of widowers also appears to recover fairly quickly, with coefficients becoming insignificant at the 5% confidence level starting their second year of single fatherhood (although still about \$5,000 in magnitude). This suggests that men may become more adept at managing their new dual role of parent and provider through time. The recovery of widower fathers’ labor income stands in stark

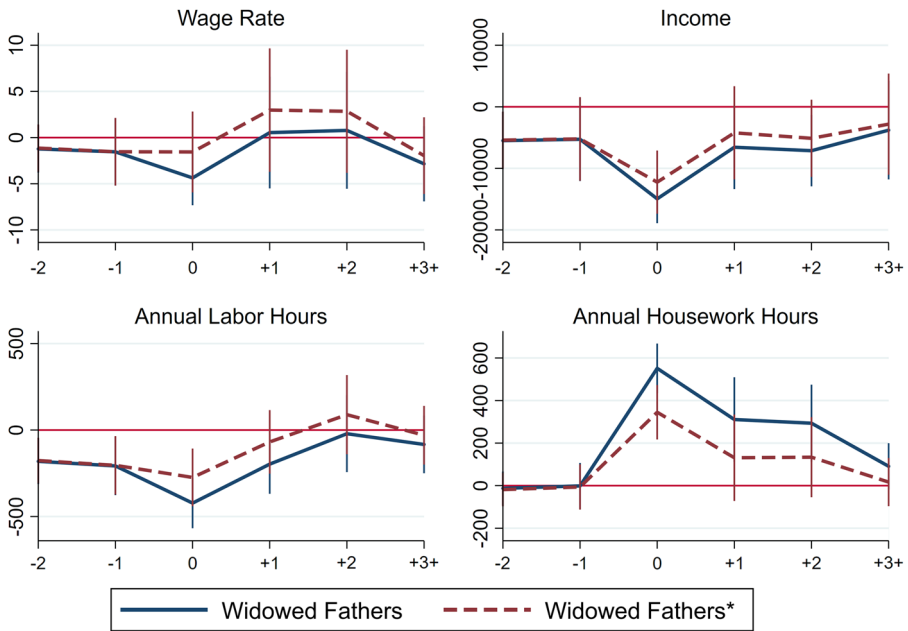


Fig. 4 Labor market changes during single fatherhood, widowers. y-axis shows regression coefficients of year vs. outcome conditioned on individual fixed effects, age, year, and fatherhood. Results for “widowed fathers*” are additionally conditioned on marital status. x-axis is years before (or after) single fatherhood begins, with “0” being the first year of observed single fatherhood

contrast to the more persistent effects of complete labor market separation. While widower fathers seem to adapt to their circumstances, panel estimates in (Kawano 2017) show that labor income takes nine years to recover after spells of unemployment. The trends for separated non-fathers are very different from those of both single father groups. Figure (5) shows estimates using observations of the 6,456 individuals observed with married or separated marital status that are never observed as single fathers. Separated men without children show no dramatic changes to wage rate, labor hours, or income concurrent with their marital separation. Housework does appear to increase, but by fewer (around 100) hours.

Table (5) show results from estimating Equation (1) using the full sample of all married and separated men.¹⁷ In these estimates, Father can be interpreted as the effect of having children in the household on outcomes. The coefficient for Single Father can therefore be interpreted as the difference in outcomes between married and unmarried fathers. As shown in previous work, fatherhood is associated with significant increases in annual income, with men earning an additional \$5,611.2 per year as fathers. Men with children also perform slightly more housework at 13.8 hours per year. After separation, single fathers experience an average decrease in labor income by \$9,594.8 per year. This is partly due to decrease in wage rate (by

¹⁷ Results shown are from unweighted regressions, estimating effect on individuals sampled after first marriage. In all estimates, similar results (available upon request) are found using longitudinal family weights.

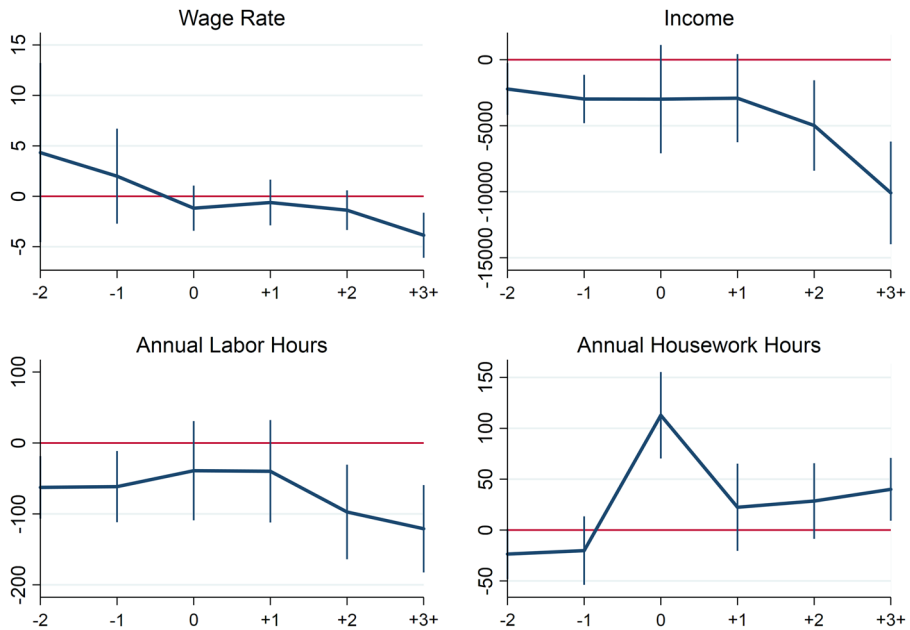


Fig. 5 Labor market changes during separation (never single-father). y-axis shows regression coefficients of year vs. outcome conditioned on individual fixed effects, age, year, and fatherhood. x-axis is years before (or after) marital separation, with “0” being the first year of observed after separation

Table 5 Effect of single fatherhood on labor outcomes, no marital status indicators

	Income	Wage rate	Labor hours	Housework
Father	5611.2*** (603.2)	1.7*** (0.4)	46.5*** (8.7)	13.8*** (5.0)
Single father	-9594.8*** (741.5)	-2.7*** (0.4)	-275.4*** (21.7)	316.5*** (15.6)
Observations	113583	105147	113583	109443
Individuals	7997	7911	7997	7997

Estimates include all married or separated men and are conditional on age and year as well as individual fixed effects. Errors in parenthesis clustered on the individual.

***, **, and * indicate statistical significance at 99, 95, and 90% confidence level, respectively

\$2.7 per hour). Single fathers also appear to work 275.4 hours less per year. A large increase in housework hours (316.5 per year) suggests that the decreases in hours and wages may be due to the additional household responsibilities associated with sole parenting.

Table (6) show results from estimating Equation (3) which adds indicators for marital separation as well as remarriage and child-maturation status after single fatherhood. As above, Father estimates the difference in outcomes between men with and without children. In addition, the coefficient for Separated compares married and

Table 6 Effect of single fatherhood on labor outcomes, all separated men

	Income	Wage rate	Labor hours	Housework hours
Father	4423.2*** (674.4)	1.1** (0.5)	20.7** (9.5)	34.3*** (5.2)
Separated	-4230.8*** (1129.7)	-1.8*** (0.6)	-107.9*** (17.0)	87.1*** (9.4)
Single father	-8246.8*** (1159.4)	-2.2*** (0.6)	-198.8*** (25.9)	257.1*** (17.1)
Post-SF (no kids)	-4303.0*** (1238.7)	-2.6*** (0.7)	-10.6 (28.7)	9.1 (15.0)
Post-SF (remarried)	-8153.6*** (1480.9)	-3.2*** (0.8)	-68.4** (28.2)	67.3*** (17.2)
Observations	113583	105147	113583	109443
Individuals	7997	7911	7997	7997

Estimates include all married or separated and are conditional on age and year as well as individual fixed effects. Errors in parenthesis clustered on the individual. ***, **, and * indicate statistical significance at 99, 95, and 90% confidence level, respectively

unmarried men and should be viewed as the effect of separation for men without children in the household. The Single Father coefficient therefore estimates the additional effect of marital separation for men remaining with their children after separation. Separation appears to explain a large portion of the differences in outcomes: separated men earn \$4,230.8 less per year, earn \$1.8 less per hour, work 107.9 fewer hours per year, and perform an additional 87.1 hours per year of housework than they did as married men. Conditioning on marital separation, however, explains less than half of the differences between single and married fathers. Even conditioning on marital separation, single fathers earn \$8,246.1 less per year, \$2.20 less per hour, work 198.8 fewer hours per year, and perform 257.1 more hours of housework per year. Although marital separation itself is associated with large and significant changes in these outcomes, it cannot completely explain the changes experienced by single fathers. Moreover, the income and wage rates of single fathers still appear to be suppressed after remarriage. After remarriage, single fathers still earn \$8,153.6 less per year and \$3.2 less per hour, while working 68.4 fewer hours per year. This suggests that adaptation to the dual role of parent-provider may be long lasting and that the presence of a step-mother does not allow men to work or earn as much as before separation. The labor differences associated with single fatherhood, however, become much smaller after children have left the household adding further support to the claim that these labor market changes may be due to single father status. Interestingly, the negative labor market effects of single fatherhood are fairly constant across the years sampled. Estimating separately for years before and after 1991 (splitting the data roughly in half) suggests decreased income, wages, and hours, as well as increased housework for both early and later years sampled.

For several reasons, one should view the results of Table (6) skeptically. Selection into divorced marital status is non-random, as is selection into single fatherhood among separated men. Presented as a potential subpopulation of exogenous single

Table 7 Effect of single fatherhood on labor outcomes, widowed vs. married men

	Income	Wage rate	Labor hours	Housework hours
Father	5081.9*** (741.9)	1.3*** (0.5)	32.3*** (9.8)	31.0*** (5.4)
Separated	-4023.5** (1784.3)	-3.5 (2.1)	-171.3*** (48.5)	238.7*** (32.4)
Single father	-9041.5*** (2105.5)	-0.1 (2.0)	-147.1** (67.8)	249.8*** (56.6)
Post-SF (no kids)	-159.0 (2051.6)	-1.8 (1.3)	37.5 (41.4)	14.8 (20.2)
Post-SF (remarried)	-9674.5*** (1766.5)	-3.7*** (1.0)	-47.1 (34.2)	48.3** (19.4)
Observations	101050	94205	101050	97364
Individuals	7865	7774	7865	7861

Estimates include all married or widowed men and are conditional on age and year as well as individual fixed effects. Errors in parenthesis clustered on the individual. ***, **, and * indicate statistical significance at 99, 95, and 90% confidence level, respectively.

fathers, results in Table (7) compare the outcomes of married fathers to men entering into single fatherhood via spousal death. Estimates are largely similar to those found using the sample of all separated fathers. Widowed fatherhood appears to cause large decreases in labor income totaling \$9,041.5 per year. This effect seems to be caused entirely by a decrease in labor hours. There is essentially zero effect on wage rate, while labor hours fall by 147.1 per year. Widowed fathers also experience an increase in housework hours of 249.8 hours per year—very similar to the 277.9 hours found using the sample of all separated men. As with other separated fathers, remarried widower fathers show little evidence of recovery—they still earn \$9674.5 less per year, with wage rate decreased by \$3.7 per hour and no noticeable effect on labor hours. After remarriage, widower fathers perform slightly more housework as well with a coefficient estimated at 48.3 hours. As before, the apparent effects of single fatherhood do not persist after children leave the household with none of the coefficients showing statistical significance.

Although widower-fathers offer a source of plausibly exogenous single fatherhood (conditional on covariates), estimates above could be biased by non-random selection out of single fatherhood by widowed fathers. If men with best labor market outcomes during their early years of single fatherhood are more likely to remarry, this would cause downward bias of estimated effects of single fatherhood on labor outcomes. Table (8) shows results for only the first year of single fatherhood, before any widowed fathers have reported remarriage. The income appears to be a diminished a bit more in the first year of marital separation and housework increases by around 383 hours per year—much more than what was seen over all years of widower fatherhood. This suggests that men struggle most to manage both work and parenting just after marital separation; this is unsurprising as this is likely a time of great change for all single fathers. The fact that single fathers experience such labor market decline in their first year of single fatherhood, however, suggests that the changes

Table 8 Effect of single fatherhood on labor outcomes, widowed vs. married men, first year separated

	Income	Wage rate	Labor hours	Housework hours
Father	5064.8*** (745.1)	1.3*** (0.5)	32.5*** (9.9)	32.4*** (5.5)
Separated	-4350.8** (1951.2)	-4.4* (2.5)	-208.2*** (53.9)	241.5*** (37.1)
Single father	-10664.1*** (2718.3)	-0.4 (2.8)	-218.3** (96.2)	382.1*** (76.1)
Observations	96180	89829	96180	92595
Individuals	7789	7694	7789	7784

Estimates include all married or widowed men up to first year observed of single fatherhood and are conditional on age and year as well as individual fixed effects. Errors in parenthesis clustered on the individual. ***, **, and * indicate statistical significance at 99, 95, and 90% confidence level, respectively

Table 9 Effect of single fatherhood on additional outcomes

	Separated vs. married father			Widowed vs. married fathers		
	Personal inc	New job	Moved	Personal inc	New job	Moved
Father	5661.0*** (821.8)	-0.7 (0.5)	-7.0*** (0.4)	6953.3*** (957.1)	-1.1* (0.6)	-7.1*** (0.4)
Separated	-7343.3*** (1143.2)	3.4*** (0.7)	13.2*** (0.7)	-10222.1*** (2407.0)	-0.5 (2.3)	7.6*** (1.8)
Single father	-7694.5*** (1331.3)	2.2* (1.3)	7.3*** (1.2)	332.5 (2864.3)	5.7* (3.3)	-1.0 (2.7)
Post-SF (no kids)	-5139.9*** (1574.2)	0.3 (1.6)	-1.5 (1.3)	2.1 (2164.1)	-0.3 (2.3)	-4.2** (1.7)
Post-SF (remarried)	-8346.4*** (1676.0)	2.4 (1.5)	4.9*** (1.3)	-10193.0*** (2101.1)	2.6 (1.8)	9.0*** (1.5)
Observations	124893	114323	124893	101050	92455	101050
Individuals	8399	8399	8399	7865	7850	7865

Estimates conditioned on age and year as well as individual fixed effects. Errors in parenthesis clustered on the individual. ***, **, and * indicate statistical significance at 99, 95, and 90% confidence level, respectively.

associated with sole parenting by men cannot be solely explained by non-random remarriage of single fathers.

Results in Table (9) show estimates of changes in some additional outcomes in the households of single fathers. First, we might wonder if the decrease in labor income (and hours) may be due to an increase in other income—single fathers may receive financial assistance from friends and family members and widower fathers may additionally receive life insurance after spousal death. For this reason, I estimate the effects of single fatherhood on fathers’ personal income. Separated fathers show a decline in personal income totaling \$7,694.5 which suggests that other income sources may explain about \$1,500 of the difference found in labor income. Interestingly, widower fathers show no change in personal income during their years of

single fatherhood, providing some evidence that transfers such as life insurance may explain the decrease in labor hours. That said, widowers (and other separated men) show significantly lower personal income after remarriage. This suggests that financial relief from other income sources cannot explain the continued decrease in labor income years after spousal death. As with labor income, personal income appears to recover more fully for these fathers after their children leave the household with separated men only experiencing a \$5,139.9 decrease and widower fathers without any statistically significant difference. Both separated and widower fathers appear more likely to change jobs (2.2 and 5.7%, respectively). There is no change in likelihood to change jobs after remarriage or after children mature, which suggests these may be transitional changes to help assist with their new role as parent and provider. Lastly, it appears that separated fathers are 7.3% more likely to report changing place of residence, while widowers show no change. This result is unsurprising as these men may be moving with their children away from the mother.

6 Conclusions

Single fathers are less common than single mothers but represent a large and growing population. Analyzing samples of the PSID reveals a variety of differences between single fathers and their married counterparts: single fathers are generally less educated and have lower labor income, hours, and wages. Longitudinal analysis suggests that during their years of sole parenting, separated fathers show substantially reduced hours, income, and wages. Moreover, the labor market changes go beyond what can be explained by marital separation alone, and similar results hold using the widower subpopulation.

This provides preliminary evidence for patterns which have not yet been reported in the literature. Further study of this group is important due to the observed decreases in their income which are quite large and appear to persist beyond initial years of sole parenting. Poor economic outcomes for these men are particularly concerning because they are charged with raising children alone, and these income decreases are likely to have real effects on the development and education of their children. Moreover, although much work has studied the effect of parenting on women (including plausible natural experiments), the career outcomes of mothers are influenced by a lifetime of career and education decisions. Single fathers, however, are unlikely to anticipate their future role as single parent and provider, so their outcomes provide unique evidence of the effect of unanticipated changes to parent status.

Compliance with ethical standards

Conflict of interest The authors declares that he has no competing interests.

References

- Angrist, J. D., & Evans, W. N. (1998). Children and their parents labor supply: evidence from exogenous variation in family size. *The American Economic Review*, 88(3), 450–477.

- Becker, G. S. (1973). A theory of marriage: Part I. *The Journal of Political Economy*, 81(4), 813–846.
- Becker, G. S. (1985). Human capital, effort, and the sexual division of labor. *Journal of labor economics*, 3(1, Part 2), S33–S58.
- Bianchi, S. M. (2000). Maternal employment and time with children: dramatic change or surprising continuity? *Demography*, 37(4), 401–414.
- Brown, B. V. (2000). The single-father family: demographic, economic, and public transfer use characteristics. *Marriage & Family Review*, 29(2-3), 203–220.
- Bryan, M. L., & Sevilla-Sanz, A. (2011). Does housework lower wages? Evidence for Britain. *Oxford Economic Papers*, 63(1), 187–210.
- Card, D., & Blank, R. M. (2008). The changing incidence and severity of poverty spells among female-headed families. *The American Economic Review*, 98(2), 387–391.
- Cancian, M., & Meyer, D. R. (1998). Who gets custody? *Demography*, 35(2), 147–157.
- Cancian, M., Meyer, D. R., Brown, P. R., & Cook, S. T. (2014). Who gets custody now? Dramatic changes in childrens living arrangements after divorce. *Demography*, 51(4), 1381–1396.
- Corak, M. (2001). Death and divorce: The longterm consequences of parental loss on adolescents. *Journal of Labor Economics*, 19(3), 682–715.
- Flabbi, L., & Moro, A. (2012). The effect of job flexibility on female labor market outcomes: estimates from a search and bargaining model. *Journal of Econometrics*, 168(1), 81–95.
- Fronstin, P., Greenberg, D. H., & Robins, P. K. (2001). Parental disruption and the labour market performance of children when they reach adulthood. *Journal of Population Economics*, 14(1), 137–172.
- Gruber, J. (2004). Is making divorce easier bad for children? The long-run implications of unilateral divorce. *Journal of Labor Economics*, 22(4), 799–833.
- Heckman, J. J., & Carneiro, P. (2003). Human Capital policy. In J. Heckman & A. Krueger (eds.), *Inequality in America: What Role for Human Capital Policy?* Boston: MIT Press.
- Hersch, J. (2013). Opting out among women with elite education. *Review of Economics of the Household*, 11(4), 469–506.
- Hersch, J., & Stratton, L. S. (1997). Housework, fixed effects, and wages of married workers. *Journal of Human Resources*, 32(2), 285–307.
- Jakobsson, N., & Kotsadam, A. (2016). Does marriage affect mens labor market outcomes? A European perspective. *Review of Economics of the Household*, 14(2), 373–389.
- Kawano, L. (2017). How income changes during unemployment: evidence from tax return data. *Journal of Human Resources*, 52(2), 418–456.
- Korenman, S., & Neumark, D. (1991). Does marriage really make men more productive?. *Journal of Human Resources*, 26, 282–307.
- Korenman, S., & Neumark, D. (1992). Marriage, motherhood, and wages. *Journal of Human Resources*, 27(2), 233–255.
- Lerman, R., & Sorensen, E. (2000). Father involvement with their nonmarital children: patterns, determinants, and effects on their earnings. *Marriage & Family Review*, 29(2-3), 137–158.
- Lin, T. F., & Chen, J. (2006). Custodial fathers-do they work more or fewer hours? *Journal of Family and Economic Issues*, 27(3), 513–522.
- Lundberg, S., & Rose, E. (2002). The effects of sons and daughters on men's labor supply and wages. *Review of Economics and Statistics*, 84(2), 251–268.
- Maani, S. A., & Cruickshank, A. A. (2010). What is the effect of housework on the market wage, and can it explain the gender wage gap? *Journal of Economic Surveys*, 24(3), 402–427.
- Mammen, K. (2008). The effect of children's gender on living arrangements and child support. *The American Economic Review*, 98(2), 408–412.
- Meyer, B. D., & Sullivan, J. X. (2008). Changes in the consumption, income, and well-being of single mother headed families. *The American Economic Review*, 98(5), 2221–2241.
- Mueller, R. E. (2005). The effect of marital dissolution on the labour supply of males and females: evidence from Canada. *The Journal of Socio-Economics*, 34(6), 787–809.
- Panel Study of Income Dynamics, public use dataset. (2017) Produced and distributed by the Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI
- Ruggles, S., Alexander, J. T., Genadek, K., Goeken, R., Schroeder, M. B., & Sobek, M. (2010). *Integrated Public Use Microdata Series: Version 5.0 [Machine-readable database]*. Minneapolis: University of Minnesota.
- Wolfers, J. (2006). Did unilateral divorce laws raise divorce rates? A reconciliation and new results. *The American Economic Review*, 96(5), 1802–1820.